Ulysses observations of fields and waves between ±80° latitude and 1.3 to 5.3 AU

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The first orbit of the Ulysses spacecraft along its highly inclined elipse is almost complete. It has traveled from the solar equator at the orbit of Jupiter to the south polar cap, then back across the. equator (at 1.3 AU), over the north polar cap, and is now at -20N and 4.8 AU descending back to the equator and aphelion. The Ulysses magnetometer has provided our first 3D view of the magnetic fields and wave.s in the heliosphere, including the latitudinal extent of Corotating Interaction Regions and shocks, conservation of magnetic flux, extent of agreement of the spiral angle with the Parker model, the detection of large amplitude Alfvén waves in the fast high latitude solar wind, evidence of magnetosonic waves associated with high latitude microstream interaction regions, and the first detection of ion cyclotron waves associated with the pickup of interstellar ions. We will review these results within the context of the more recent data and analyses with emphasis on those aspects relevant to the acceleration and transport of solar energetic particles and anomalous and galactic cosmic rays.